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Technology in Everyday Life: Conceptual Queries

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AN ISSUE AND A THESIS

According to Norman Macrae, an editor of The Economist, the world had produced, in the 40 years since World War II, seven times more goods than throughout all history.[1] This is well appreciated by lay people, but has hardly affected social scientists: they do not have the conceptual apparatus for understanding accelerated material-technical change and its meaning for people's personal lives, for their ways of relating to themselves and to the outside world.

Of course, a great deal of speculation about emerging life forms in industrialised societies exists. And social scientists with a futuristic bend have projected their diverse visions upon public debates, ranging from the Efficient Hedonism of "post-industrialist" society à la D. Bell to the Responsible Convivialism of "post-materialist" critics such as F. Schumacher or I. Illich. Competing images of the coming "services society" or "self-service society" share a central concern: the changing relation between the spheres of large organisations and personal lifestyles, between salaried work and private consumption. They also share a certain implausibility: few people recognize themselves in either projection. And they share ubiquitous reference to "technology", without accounting for it in real terms.

A good diagnostic of what is actually happening seems to me to be J. Gershuny, who sees a drift toward a particular type of self-service economy: a quite radical shift in the mode of provision of social services, as he calls it, based on new kinds of consumer technologies (1983, 1984). Industrialization used to be partial, but is becoming total fast.

This process obviously has many facets. The one I am interested in here is the intrusion of modern technology into spheres of life which in the past have been relatively little dependent on it. To be sure, the diffusion of technology into people's lives outside the big work organisations has been

going on for some time. But the transformation of informal daily life settings into settings that are universally fitted with all kinds of technical installations and tools and networks and machinery is continuing in an accelerated fashion. The social sciences are clearly at a loss as to what this means in terms of changes in the structure of action and awareness of people undergoing these processes, beyond the changes in economic relations pointed out by Gershuny and others.[2] Recent theorizing on these matters is characterized by remarkable conceptual diversity, and by the same token considerable controversy regarding the social problematique of the technisation of everyday life.[3] I will not talk here about the latter, but rather present a thesis concerning the inability of all such approaches to come to grips conceptually with problems that arise from technisation. And I will present a few ideas as to how this inability could be overcome.

The thesis can summarily be introduced in three steps:

(a) The social sciences have no concepts for dealing with technology because they have no concepts for things and tangible events in general. They have left the world of matter and tissues, the material-organismic world, to use Popper's term, to the natural and engineering sciences, and they have constructed themselves a world of actors devoid of things.

(b) They have lost touch, therefore, with the process of modernisation, which cannot be understood without accounting for the way human actors and societies deal with the material world, how and why and with what results they transform material-organismic environments into artificial technical environments. This is deplorable not only because social scientists are constantly asked to advise in matters such as how to speed up the process of modernisation, or how to repair damages resulting from it. They also freely offer interpretations and pontificate about possible and desirable social futures.

To a certain extent, their deficient social theories thus become part of the way people construct their world and use their things; of the way, in A. Giddens' terms, society is produced and reproduced constantly. This applies to the social theories of those who manage and control and sustain the big formal enterprises of industrial society as well as to the everyday life-theories of people making use of technologies in solving their personal problems. So, social scientists may not be of much use, but they may still be quite influential.

(c) This must not be so. The social sciences can legitimately deal with the material world and its transformations into artificial environments in their own terms. They can and should deal with technical artifacts much more systematically and indeed contest the monopoly of the natural and engineering sciences in explaining, and putting to practical uses, material processes.

A PRELIMINARY CLARIFICATION OF TERMS

In the following, the word technology refers to artificial things, and more particularly modern machines: artificial things that (a) require engineering knowledge for their design and production, and (b) perform large amounts of operations by themselves. This must be clearly understood, as it is by no means self-evident to reserve the term technology for machines and machinery, except in everyday usage. In fact it is a misnomer for machinery. The term refers, strictly speaking, to bodies of special knowledge *about* machinery, either in the sense of specific engineering knowledge, or in the more general sense of theories of engineering, analogous to theories of science.[4] In contrast to this then, "technology" refers here to technical things themselves, not to the scientific and engineering speech acts about these things, and also not human acts dealing with them, except those that are immediately required for machinery to operate.

The next term, everyday life, is a difficult one. I will not use it with all the supercharges of meanings given to it in phenomenological social psychology and sociology or in ethnomethodology, for example. It is used here to denote a type of action, or meaningful behaviour, which is not, or relatively weakly, formalised.[5] "Formalised action" refers to action which is (a) regulated to a large degree by impersonal media, such as money, markets, bureaucratic rule, legal contract, technical norms, and (b) oriented toward some calculable criteria of "rationality" in the sense of efficient performance. Professional action is formalised, lay action is not. Working under contract with an employer is formalised, housework is usually not. Providing for one's needs through the market is more formalised than picking berries in the woods. Driving a car through London is a more formalised mode of travel than wandering about the countryside. So there are activities governed by explicit rules, stating what is properly to be regarded as "rational" and what is not, irrespective of personal or social idiosyncrasies, and there are activities governed by rules of a different kind. I use the term everyday life as a label for the latter.

The term social sciences will mainly refer to social psychology and sociology, not so much to economics or anthropology, which tend, at least in part, to include material goods much more prominently in their central concepts.

THE SOCIAL SCIENCES AND THE WORLD OF THINGS: CONCEPTUAL BLIND SPOTS

More than a decade ago, in a perceptive article titled "Psychology and the World of Things", C.F. Graumann wrote: "Recently pyschology has come into contact with the world of things, an event which has produced some

theoretical embarassment" (1974, p. 389). He referred to developments in so-called ecological psychology which, at the time, seemed to him quite helpless about how to relate real-life environments to general psychological theory. And he went on to reconstruct the history of psychology's failure to take into account the things that make up our daily lives, pointing out, for example, that the "goods"-character of things, the implications of a thing being owned, and by whom, has no place whatsoever in psychological theorising about the constitution of things in experience. He noted that for this reason psychologists could hardly enter into a fruitful discussion with a powerful tradition of social philosophy relating ownership to such phenomena as alienation. Indeed, much social thinking following Marx is based on certain assumptions concerning the mental and social damage wrought by separating ownership of capital goods from ownership of goods produced by them; of separating the skills necessary to produce things from the skills necessary to use them; of treating manpower as if it were a commodity, of treating nature as if she were raw material, to be appropriated freely.

H. Linde, for example, has advanced similar arguments for sociology (1972). According to him, man-made objects, "the institutional qualities of the behaviour patterns (*Handlungsmuster*) embodied in things and the social consequences of their realisation" have been effectively "ostrasized" by Weberian and structural-functional sociologies (p. 9). Graumann's and Linde's and other people's argument here is, in the first place, that social psychologists and sociologists are unable, owing to the absence of concepts for things, to relate their theories to social philosophical and everyday interpretations of the modern predicament. I want to extend this argument and demonstrate, that the specific difficulty we have in understanding technological change hinges on this more basic difficulty – to account, conceptually, for things.

When I talk about things, I mean all kinds. Big ones, such as energy plants, cities, transport systems, oceans, in the extreme Spaceship Earth; medium ones, such as houses, trains, ponds, windmills; small ones, such as telephones, keys, pencils, microchips, in the extreme maybe electrons or radiating particles. Some may point out that making, e.g., a telephone a small thing is wrong, considering the telecommunications network it is part of, which in turn includes quite big things, such as satellite systems, not to speak about Ariane, the technical system developed to lift these satellites up into space. Or maybe an ocean is not really a big thing, because in practice it never becomes relevant as such, we never deal with it in its entirety. And this, precisely, is the point. We are quite unable to arrive even at a simple classification of things in terms of their scale – whether they are big or small – in a way that makes sense psychologically or sociologically. And yet everybody talks about the social problems of big

technology and the wonders of beautiful small things. So, nuclear plants are taken to be big, chips are taken to be small, even by engagé social scientists – but on what grounds?

It seems important to underline, that this critique of the "worldlessness" of social psychology and sociology is directed at the level of general theory. In all fairness it should be said that research in the many fields of applied social science does indeed deal with artifacts of all kinds. Industrial psychology, urban sociology, consumer and marketing research, the sociology of fine arts, research on the military, traffic, the police, handicapped children, industrial design, community planning, energy and environmental conservation – all deal with material infrastructures and equipments and specific classes of objects, and with people's interactions with them. It can be easily shown, however, that the concepts used for the material elements in these fields tend to remain external to their psychological and sociological elements, and by the same token entirely unrelated across different applied fields.

The reason for this is that concepts for the material side of social reality cannot be derived from general theory, and therefore either remain *ad hoc* or are borrowed from relevant engineering terminology or from the subjects under study – workers or employees, doctors or patients, teachers or school children, bureaucrats or citizens, etc. If researchers wanted to go back to their general psychology or sociology textbooks, they simply would not find the stuff they deal with in their books' indices. In short, the closer one moves to the sacred inner circles of theory-building and systematic empirical generalisation, the more devoid of things social science becomes. And the dominant paradigms in both psychology and sociology simply do not lend themselves to an integrated analysis of either man-nature or man-technology interactions.

All this is not to say that conceptual frameworks allowing for this have not been envisaged. One would be, of course, Kurt Lewin's, for many ecological psychologists the father of that discipline, presumably because, in his chapter 8 of "Field Theory", he introduced systematic ecological concepts (1951). But I do not feel Lewinian psychology, read closely, could be considered a solution. Its concepts remained strictly intra-phenomenal, things exist as experienced by the individual person – in his or her social context, to be sure – only, and programmatically so. Lewinian life space remains, in other words, incapsulated and a bit ephemeral, without substance and even intersubjectivity. To quote Bronfenbrenner, "a world of imagination, fantasy and, indeed, unreality" (1977, p. 202). And Lewin strictly rules out any possibility to link his concepts to concepts of sociology, economics, or geography.

Another seemingly promising attempt was made by Mary Douglas, the anthropologist, in "The World of Goods" (1979). Here, things are indeed

given a constitutive role, however, in a quite one-sided sense. Goods are essentially "markers", they serve symbolic and expressive functions. They signal to others the personal and social identity and location of the bearer. Goods only speak, so to say; they do not act, or sustain actions. It's all – to paraphrase a famous title – about how things are used to do things without words. But things do more than speak. A washing machine or a central heating system or a car do much more than mark the social place of their owners. They do work, among other things, and Douglas & Isherwood hardly mention this, conceptually.

The lack then of any systematic treatise of the psychology or the sociology of things is one of the reasons why applied fields, where things must always be dealt with for better or worse, remain theoretically weak. This has not always been so. Classical traditions in sociology and, as Graumann shows, to an extent in psychology, have given material things a very prominent explanatory role in the constitution of mental and social processes. To give, again, only two examples. For Marx, capitalism as a social form is constituted by a certain way of using things to control other people's actions. Durkheim, in his "Rules of Sociological Method", says that in order to understand social facts one should look at the material facts, or rather artifacts, a society is endowed with. Things are, in his view, social facts.

Linde (1972) has argued, that with the arrival of post-war social systems-theory such notions have been discarded very effectively, and a similar case could be made for cognitive psychology as well. Why this has happened is a matter for separate speculation. One may assume with Linde that one of the reasons was and is methodological purism. Including the material-organismic world in social and psychological analysis brings up all kinds of philosophical and epistemological issues which reigning philosophies of science have ruled to be solved either through elimination or through dividing them up neatly along disciplinary lines. Hence, the physical world became the world of physicists and biologists, and the world of actors' became the world of social scientists, and the world of knowledge became the world of the philosophy of science. Each group relegated the world of the other, at most, to the status of a mere environment, of their domains.

Whatever the historical, and indeed social, in the sense of extrascientific, reasons, it seems that the social sciences have lost, somewhere along the road, in their concepts the domaine of things. Psychology has not only lost "the other", it has also lost things. Sociology has not only lost "the person", individual human agency, it has also lost things. And just like the rediscovery of the "social" in psychology, and of the (lay) actor in sociology, allows the two fields to converge in many senses, a rediscovery of the mental and social constitution and functions of things, particularly

modern things such as machines, will necessarily lead to more unified approaches.

HOW TO CONCEPTUALIZE THINGS?

The thing to do, then, is to start talking about things in the same conceptual terms we use for talking about people and the social process. We must, in other words, represent things, whether man-made or not, conceptually in terms of action. Things are linked with human acts in the same way other human acts are linked together. This does not mean that things are actors, no more than that people are acts. It means that we give meaning to the behaviour of things the same way we give meaning to other people's behaviour, and that we expect other people to do the same. Things are partial acts, and they can represent almost any human acts. Represent means "stand for": by symbolizing something, by substituting something, or by being a necessary part of something. If things are to represent actions, they must be integrated with actions, and I will use these two notions of things representing actions and being integrated into actions from now on.

Talking about things in the terms used for talking about human activity (or passivity for that matter) can obviously be done in as many theoretical languages as there are theories or schools of thought in the social sciences. At the present stage it does not seem to matter much which language is used, as long as they are used at all. Of course, one will get very different results depending on the language one chooses. Things will be conceived quite differently if one uses, for instance, social identity theory or some brand of Parsonian sociology, and so on. Marx used to talk about "the control things exert over us." Schmalenbach, the German sociologist, has applied the categories of Tönnies – *Gemeinschaft* and *Gesellschaft* – to categorize things (1927). Mead, in talking about thing-constitution, speaks about children constituting, e.g., a bicycle by "taking the role" of the bicycle (1938, p. 109 f.), Elias in his treatise of Time refers to clocks as "normated events (*Geschehensabläufe*) with recurring patterns ... (serving as) regulative and cognitive symbols" and exerting discipline (1984, p. vii f.), and so forth. I will not at this point discuss the issue of choice of language. Rather, I want to point out three modes of representation of actions by things which should be made amenable to analysis irrespective of conceptual language chosen, in order to understand processes of technisation in everyday life. These are

(a) technical and non-technical forms of representation;
(b) multiple representations and conflicting representations;
(c) representations in (professional) contexts of making things and in (lay) contexts of taking things.

Simplifying radically, one might say that all social psychological and sociological theories explain human conduct in terms of certain norms, or desired states on the one hand, certain types of knowledge or beliefs about the actual state of the world on the other. It should be possible, in other words, to identify in most social science theories roughly equivalent constructs describing what is wanted of the world and what is believed about the world, and to show that social action or process is related to these, can be explained in terms of these. This granted, the basic paradigm for explaining people's uses of things would, in a nomological vain, read somewhat like: "Whenever people want something (or are made to want something), and at the same time know (or are made to know) what a thing can do, they will integrate the thing in question into their action in such and such a way, and expect others to do so."

Marxian social studies, for example, are entirely focussed on two aspects of this paradigmatic notion: they elaborate the want-aspect and the be-made-to aspect of it. Marxian social theory is all about what happens to society and people, and actually to things too, when – in the interest of a few people – most people are made to want and made to know only very restricted uses of things. Or, one could say, it is mainly interested in how the power and right of access to things, particularly capital things (i.e. means of production), are institutionalised in the interest of select groups.

But the formula has, in the terms relating knowledge and belief to the use of things, and also in the terms refering to active use, other elements crucial for understanding technology and technical change. The following aims at an elaboration of this dimension and its juxtapositions with the first.

MODES OF REPRESENTATION: TECHNICAL THINGS AND NON-TECHNICAL THINGS

There is a class of things which is normally sufficiently characterized by the goals they serve or by the motives behind their use. A crutch is a helping thing, chains are dominating things, a badge or a cap are things for social identification. But there are other things that can be best characterised by their internal organisation, their mechanisms, and by the form in which these are linked with other acts. So we will say that a thing is perfect or crude, efficient or inefficient, economical or wasteful, etc., depending on its internal structure and the way it is linked with antecedent or consequent human behaviour. Cars may be fuel-efficient, clocks may be precise or imprecise, a washer may be economical or wasteful, as a function of its contribution to certain actions quite irrespective of underlying motives or goals.

Monuments are power-things, pride in tradition-things, sometimes

hate-things to be bombed, but it makes hardly sense to deal with them in terms of efficiency or precision. Electricity plants are power-things too, but in a different meaning. It makes sense to look at them in terms of their efficiency, or in terms of their reliability in providing power to all kind of activities, (almost) without referring to moral purpose.

I will now call things that mainly represent goals, values, purposes, etc. non-technical things, and things that represent mainly instrumental action, specific means-end-relationships, technical things. The goals non-technical things represent tend to be terminal values, to use Rokeach's term; the means-end-relationships technical things represent tend to be more or less complex cognitive-instrumental activities linked to specific functional properties of things themselves.[6] A microchip embodies an enormous amount of highly sophisticated knowledge taken from all kinds of physics, mineralogy, logic; making it work within a computer represents yet other bodies of knowledge; and the chip actually working represents all kinds of information processing activities. Much social theorizing is concerned, in a roundabout way, with secular conditions and consequences of using nature and artifacts to represent terminal – if bad – values. In contrast, a social psychology and sociology of technology would in the first place have as its subject matter nature and material artifacts inasfar as they represent complex and sophisticated cognitive and organisational schemes for perfecting specifiable means-end-relationships.

Obviously there is no such thing as technical or non-technical things *per se*. The question is whether things are *de facto* integrated in a technical mode into action or not. One and the same technical thing will always be integrated in a technical *and* non-technical fashion, will represent technical behaviour and non-technical behaviour. But the technical mode will often dominate experience, and its deconstruction is peculiarly more difficult than the deconstruction of non-technical representations. A power generator is integrated in, or represents, technical action as long as it is kept running, or under repair to do so. Hence it is a technical thing. When it is topped with a red flag, during a strike or at an opening ceremony, or when it is taken to the industrial museum, it acts in a non-technical mode, has ceased to be a technical thing.

But usually dominant modes of integration are quite stable, and greatly stabilized by the overall contexts of meaningful action they are part of. And it may take quite an effort to disintegrate things from their proper place in our action patterns. It is not easy to look at a flower as a physiological machinery, and it is not easy to look at a toilet seat as a piece of art – at least in everyday life. Some people will never feel able to consent that mice are engineered into drug producing plants, and some engineers would rather see people killed than have their nuclear plant dismantled or made into a symbol of death. The deconstruction of representations and

the enforcement of incompatible representations may require or elicit great violence.

In sum, technical things must be distinguished from non-technical things in the sense that they represent very different types, or modes, of action. While in both modes things symbolize, substitute for, facilitate and stabilize, indeed make possible in the first place social interaction, the specific components or aspects of social life they represent are very different, and life forms change with changing integrations of things.

Modern societies, as social life forms, are – among other things – very large and fast systems of action, due to the fact of integrating large scale and fast machinery. "Small" everyday life technologies are almost always (more or less tightly coupled) peripheral elements of such largely out-of-awareness deep structures. The integration of even larger and faster technical systems and their expanding peripheries in modern life forms is made possible by the institutionalized process of knowledge generation in the natural and engineering sciences, and in this sense a social psychology or a sociology of technical change presupposes an understanding of the emergence and dynamics of modern science as much as it rests on the understanding of power and social conflict.

MODES OF REPRESENTATION: MULTIPLE INTEGRATIONS AND CONFLICTING INTEGRATIONS OF THINGS

But of course the structure and tensions of social relations are always reflected in – and in turn stabilized or disrupted by – the ways technical things are linked to more inclusive action. Here the notion of simultaneous, and conflicting, integrations of things as technical and non-technical can be usefully generalized. One and the same thing practically always is integrated in several different action patterns and in the action patterns of several different actors. No thing serves one person alone or all in the same way, and no thing serves only one purpose or represents only one means-end-relationship. Take a nineteen-year-old boy and his car: it serves him as a means of transport, as a status-marker, as a source of fascination with things technological, as a retreat from home, as an instrument to express aggression, as pastime, as a repository for his personal hi-fi system. It also plays a role in certain action patterns of parents, policemen, repairmen, salesmen, pedestrians, girlfriends, and it has already served previous owners, workers who produced it, engineers who have designed it, shareholders, patent lawyers – where to end?

The multiple representations, and in fact histories of representations, that constitute a car or type of car are not always compatible. Fascination with technology may promote uses that conflict with uses prescribed by

relevant regulations, sentimental attachment may conflict with the need to turn a car into money.

Generally speaking, there are certain recurring types of incompatibilities in multiple or rival integrations, over and above conflicts between technical and non-technical integrations mentioned above: a) incompatibilities between personal integrations, as in conflicts over individual ownership or other rights and duties; b) incompatibilities between collective integrations, as in distributional conflict over costs and benefits of technologies; and c) incompatibilities between collective and personal integrations, as in conflicts over individual rights to use technologies which endanger others or over the legitimacy of collective rules imposing limitations on the uses of things (Joerges, 1979). In this view, conflicts arising from incompatibilities between technical and non-technical integrations are but special and often minor cases within these broad types of incompatibilities.

It can be shown that public controversies about the social installation of new technologies arise, as a rule, from all such incompatibilities. Much of current research on "the social shaping of technology" can be reformulated in these terms, even if it has little to do with the social shaping of machinery, i.e. the transfer of action onto technical things and its consequences. In this sense, these studies do not deal with technical things themselves, but rather with the redefinition of non-technical, in the last analysis moral, rules for the integration of technology.[7]

It seems to me then that the drama surrounding the progressive transformation and substitution of technical for non-technical action made possible by the integration of machinery, with its requirements to submit large areas of behaviour to norms embodied in physical events and with its need to reassimilate technical action to non-technical orientations, is inexorably but quietly played out on the back-stages. Accordingly, social research doesn't take much notice. The battles around "choice" of technology, about access and ideological interpretation of technology on the other hand, played out prominently and at times noisily on the forestages, chiefly affect the relative speed and the schedules of technical integrations under varying conditions of power and conflict, not so much the direction they take and their universal consequences. Current research on technology is tuned in mostly on the battle noise.

MODES OF REPRESENTATION: MAKING THINGS AND TAKING THINGS

A third aspect concerning integration of things, particularly technical things into action concerns the difference between the ways things represent action in the process of making them and in the process of using them. Again, this is a very crude distinction. Contexts of making things

may range from dreaming up and inventing things, creating and, constructing things, to copying things, assembling things, improving things, etc. Similarly, using things made by others may mean operating them, servicing them, playing with them, depending on them, be treated with them, etc. But most social science approaches to cope with things as constituent parts of human action fail to make this simple distinction. Psychologists studying thing constitution, for example, have always restricted their analyses to the issue of how *given* things are assimilated into experience.[8] Historians and sociologists of technology have consistently looked at processes of invention only. Industrial sociologists have dealt with workers' use of machinery without looking at how it was generated nor at what people do with the things it helps in making.

One reason why the two perspectives should be mutually related is, of course, historical. Part of the process of modernization consists precisely in segregating and organizing separately the two types of process, both at the institutional and the personal level. In Marxian thought this has been interpreted as a means of social control and as a basis of alienation. Emphasis was on that class of particularly powerful things that are made to be used to make other things, the means of production. And, without having a systematic theory of things, industrial sociologists have long been particularly fascinated by the social history of the machine-tool industry. "From the machine-shops of a nation came the dies that are used to stamp or form nearly every mass-production item, from automobile fenders to soft-drink bottles – as well as the precision-machined goods of the old and new industrial areas, from tank turrets and turbine blades to disc drives for computers" (Fallows, 1984, p. 11). Here is the prototypical industrial thing. But home computers to be used to produce software for one's own use partake of both contexts, too, and so do washers, cars or hi-fi sets.

Another, closely related aspect is the very large difference in the types and kinds of knowledge represented by a thing-in-making and the same thing-in-use. Most of the technical things we use in everyday life represent relatively low-grade, lay knowledge, while in the process of their production they represent high-grade professional, science-based knowledge. Science and other forms of expert knowledge get into everyday life via technical things but, alas, in a very impoverished form.

On the other hand, anticipations of the potentials, needs, resistances of the takers of technologies in many ways inform their making. Technological style, a concept much used in social constructivist approaches to technical change (see Bijker *et al.*, 1987), is probably as much an outcome of anticipated user expectations as it reflects professional or organisational cultures of the makers of technologies, or the political interests of their regulators.

Further elaborations of this aspect would require careful differentiation

of the temporal dimension of technisation, especially the distinction of "phylogenetic", "ontogenetic" and "actual genetic" frames of reference. Irrespective however of temporal scale, there remains the basic issue of understanding the "arc of action" leading from making technical artefacts to their "freestanding" operation and back to taking them, the question of conceptualising the process of "reciprocation" and "leverage" taking place while going through the arc.[9]

A change in perspective may be required here which abandons deeply entrenched notions of things as "media" of social exchange, at least for a time. Early advocates of a social science of things, like Graumann or Linde, began likening things to institutions or entities otherwise embodying action, but still somehow retain their medial character. Scarry's notion of the "freestanding artifact" suggests another metaphor: that of things as social counterparts of social actors, whether personal or collective, exchange and indeed reciprocation taking place beteween *the*se two parties. This is, incidentally, a perspective much closer to everyday life modes of experiencing things, whether in making them or taking them, namely as somehow sentient extensions of ourselves, capable of acting in unexpected ways and insistent on opening yet other cycles of reciprocation.

I do not want to advocate unduly the use of everyday life "constructions" of things as theoretical resource, and the notion of technical things as "subjective actors" should, for the time being, not be welcomed in social science discourse.[10] Still, the conceptual language we choose, and their underlying "root metaphors" (Brown, 1977), cannot entirely be dissociated from everyday life worlds.

THREE PERSPECTIVES ON CONCEPTUAL ISSUES AND THE PROBLEM OF AN EMPIRICAL RECONSTRUCTION OF EVERYDAY LIFE

Up till now I have insisted that it does not matter much whether we conceptualise things in a Marxian, Durkheimian, Meadian, Garfinkelian, or even Skinnerean mood, as long as they are brought back to the fold and as long as it allows us to treat certain basic differences in the modes things represent actions: technical and non-technical, types of multiple and conflicting integrations, contexts of making and of taking. This can now be qualified by distinguishing three broad types of social scientific languages.

One is general systems languages (GSL), that is, attempts to apply concepts derived largely from engineering sciences and biology to social processes and to use the cybernetic imagery that goes with them.

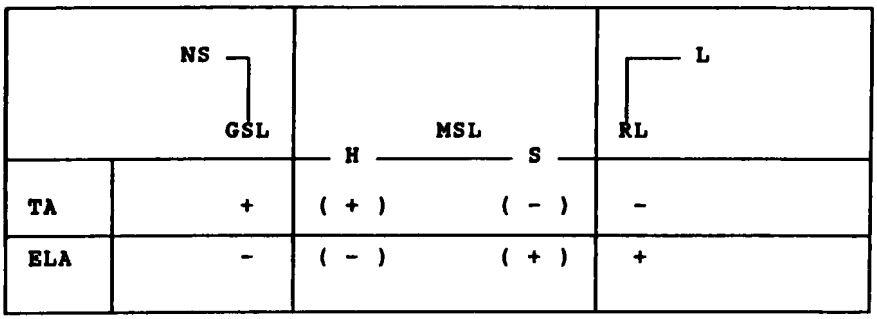
A second type, which I will call mainstream languages (MSL), denotes

social psychological or sociological approaches which are reasonably empirical-analytic in orientation, but also reasonably aware of the inevitability of normative entanglements and the dialectic of social science and social process.

A third type, denoted radical languages (RL), refers to critical approaches in psychology or sociology which are radical in the sense of professed partisanship or a conscious attempt to let social problems and constructions 'out there' be reflected in the concepts used.

What I have introduced in the beginning as "problems arising from technology intruding in everyday life" will in GSL be considered as disequilibrium, tension, friction, dysfunction, maladaptation, with in-built assumptions that these can be brought under 'rational control' or that societies (sometimes personalities) are some kind of self-repairing systems. In RL it will be called crises, antagonisms, or simply idiosyncratic 'social constructions', again with certain in-built assumptions from some philosophy of history or relativistic epistemology.

What happens, when these types of languages are applied to the issue at hand by their proponents, is shown in the diagram. GSL are particularly adequate in describing the technology and technical integration aspects of the issue, RL are particularly apt in describing the everyday life parts of the issue. Both fail conspicuously in their opposite corners.



TA	Technology Aspect	NS	Natural Sciences
ELA	Everyday Life Aspect	L	Literature
GSL	General Systems Languages		
MSL	Mainstream Languages	H	"Hard"
RL	Radical Languages	S	"Soft"

MSL, i.e. mainstream traditions have a "feel" for both aspects and for the problem of interferences, but are not really coming to grips with both, especially because they are oblivious of the material-organismic components of social life. However, both in social psychology and in sociology two kinds of mainstreams may obviously be distinguished: "hard" approaches closer to GSL (denoted H in the diagram) and "soft" approaches closer to the radical-humanistic languages (denoted S). In my view, these two sociologies and social psychologies do not really compete. They are not rival theories, but have different subject-matters: they select differently from the streams of life and consciousness. Some are more concerned with processes of organisation, control, instrumental action, cognitive structure (H); others more with cultural values, affective processes, fantasy and imagination, ritual action (S). The latter are somewhat better in capturing everyday life forms, the former in dealing with technology as one form of rationalized action.

Over and above the general requirement to apply whatever social science language one uses to the material-organismic side of social life, there is then indeed a question of which conceptual language is more suitable and fruitful. I do not want to suggest a kind of "conceptual anything goes", but rather, a certain amount of competition in the first place. In the second place, however, I want to suggest a kind of controlled, directed eclecticism. What we would clearly like to have, in dealing with things, and particularly with technical things in largely non-technical everyday life contexts, is a language which produces fat plusses (+) in both rows of the diagram. But I do not think this is possible within a unified conceptual scheme.

The reason is that everyday life forms are not in the same way capable of empirical reconstruction as highly formalized social processes. True, they can be analyzed and accounted for conceptually, that is in a language different and more powerful than the one used by everyday life actors themselves (L in the diagram). But not in the same nice and clean way as technical things are described in engineering concepts (NS) and as the formalised social processes can be described in the neat measurable concepts of the harder social sciences. It is easier to reconstruct, empirically, monetary exchanges, legal relations and repetitive interactions with machinery, than to reconstruct everyday life activities. These are much denser, in the sense of combining and merging many possible forms of relating to things, to others and to oneself, and therefore tend to preclude description in the terms of specialist social sciences modeled on rationalised action.

Indeed, there can be little doubt that the best studies of everyday life forms are narrative rather than analytical in character, literary in style rather than systematic. Sometimes we comfort ourselves by saying that

they are qualitative in method. One somewhat disquieting conclusion from this is, then, that it will be very difficult to say anything very definite about what technology does to everyday life, as empirical scientists.

I have begun by pointing out two implausible social futures and by saying that one process that is clearly emerging is the transformation of our everyday environments into complex ensembles of technical artifacts. I have assumed that this creates problems. And I have tried to argue that, in order to understand these problems, one must begin to take into account things conceptually, particularly technical things.

To the extent that this argument is viable, putting it into research praxis requires ignoring conceptual confines of academically codified discipline. The historical division of labor at the level of the production of knowledge, between disciplines like sociology and social psychology as well as between the social sciences generally and the other "sciences of the artificial" (Simon, 1981), has enabled modern societies to change into life forms which now escape analysis – if we stick to this regime. To paraphrase Gidden's summing-up "new rule of sociological method" (1976, p. 162): If, as social scientists, we want to explicate the production and reproduction of modern society as the accomplished outcome of human agency, we must be able to explicate and mediate emergent forms of life, and their languages, within appropriate meta-languages of social sciences.

We might take things more seriously.

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NOTES

[1] See "The IHT's Paris Conference: New Issue for a New Era", International Herald Tribune, 2.5.1987.

[2] Gershuny is not centrally interested in technical change, and this may partially account for the "well-tempered computer" philosophy underlying much of his reasoning. He tends to ignore new forms of dependency on large formalized systems that come with new forms of household production, and generally distributional issues inherent in technological change.

A more perceptive analysis, albeit again not focusing on technological matters, has been presented by Pahl (1984).

[3] See e.g. Hörning, 1987, Joerges, 1987, Rammert, 1987, Weingart, 1987, Zapf et al., 1987, as well as other contributions in Lutz (1987) for a range of perspectives.

[4] The term is of course often used for whatever body of systematic instrumental knowledge, concerning all kinds of actions that can be organized in the form of precise, predictable means-ends-relationships, or, still more inclusively, all action organised according to rational principles. So one can talk about educational technologies, organisational technologies, social engineering etc. Indeed, most definitions of technology offered in social science literature explicitly state that the term technology, even in the sphere of material production, should not be mistaken for the material process and the machinery itself, but should refer to the "social" process surrounding machinery – as if machinery was not social. There are even books on technology where technology, in the sense of machinery, does not appear on a single page (e.g. Gouldner, 1976).

[5] No attempt is made to continue the unfortunate distinction of the terms "action" and "behaviour", see Graumann (1980).

[6] The means-end terminology is less problematic for machine action than for human action, although still quite common in the philosophy of action (see e.g. Harré, 1982). It should be understood as a first approximation of the difficult distinction of practical or operative aspects of machinery and purely "textual" or symbolic properties of material artifacts (see, for a perspective elaborating the latter, Hörning, 1985).

[7] For a representative collection see MacKenzie and Wajcman (1985). An exception is L. Winner's "Do artifacts have politics?" (reprinted from 1980), answered with "yes", albeit with few convincing examples and without a systematic attempt to clarify the "interior structure" of artifacts. The volume contains, however, splendid case studies relevant to this issue, particularly in its historical analyses of military technologies.

[8] See Graumann (1974) and with reference to G.H. Mead's penetrating analyses of the social (intersubjective) aspects of thing constitution Joas (1980).

[9] Elaine Scarry (1985), who uses these terms in a way reminiscent of Arnold Gehlen's anthropological concept of "*Handlungskreis*", has recently attempted a general theory of artifacts, both linguistic and material, technical and non-technical.

[10] Suggestions to conceptualise sophisticated technical machinery, prominently of course AI-machines, as "actors", i.e. subjects, not objects of study (Woolgar), have cropped up recently in social constructivist contexts (see e.g. Woolgar, 1986 or Callon, 1987). R. Collins speaks about sociology's decisive contribution to the ceration of a "computer that can think and talk like a human being" (1987, p. 1349), forseen by him on the basis of a new sociology of emotions (this quintessential domaine of a sociology of everyday life, B.J.).

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